WHAT IS CLAIMED IS:

1. Device for the correction of the power factor in power supply units with forced switching operating in transition mode, comprising a converter and a control device coupled with said converter so as to obtain from an alternating network input voltage a regulated voltage on the output terminal, said converter comprising a power transistor, said control device comprising a pilot circuit suitable for determining the switch-on time and the switch-off time of said power transistor, characterised in that said control device comprises control means coupled with said pilot circuit and with said converter and which are capable of prolonging said switch-on time period of the power transistor at the instants of time wherein said alternating network voltage substantially takes on the value zero.

2. Device according to claim 1, characterized in that said pilot circuit comprises an error amplifier having a first signal at the inverting terminal input that is proportionate to said regulated voltage and a reference voltage on the non-inverting terminal, means for generating a ramp voltage signal comprising a capacitor, a first generator of a current signal suitable for loading said capacitor and a switch arranged parallel to the capacitor and commanded by said pilot circuit to discharge said capacitor, a comparator capable of comparing said ramp signal with an error signal from the output of said error amplifier and capable of providing an output signal suitable for determining said switch-on time period of said power transistor, said control means being coupled with said means for generating a ramp voltage signal so as to decrease the value of the load current of the capacitor at said instants of time wherein the alternating network voltage takes on a value that is substantially zero.

3. Device according to claim 2, characterized in that said control means comprise a detector means suitable for extracting from a signal that is proportionate to the current that flows through said converter a rectified sinusoidal component with a period that is the same as half the period of the period of the network voltage, a second current generator coupled with said first generator and further control means which have at the input said rectified sinusoidal component and are capable of commanding said second current generator so as to decrease the value of the load

current of the capacitor at said instants of time wherein the alternating network voltage takes on the value zero.

4. Device according to claim 3, characterized in that said detector device extracts said rectified sinusoidal component from a signal that is proportionate to the current that flows through said power transistor.

5. Device according to claim 4, characterized in that said detector device is a peak detector of the current signal that flows through said power transistor.

6. Device according to claim 3, characterized in that said converter comprises a rectifying circuit of the network voltage, a capacitor arranged parallel to said rectifying circuit and an inductor arranged between said capacitor and said power transistor, and in that said detector device extracts said rectified sinusoidal component from a signal that is proportionate to the current that flows through said inductor.

7. Device according to claim 4, characterized in that said detector device comprises a low-pass filter and an amplifier.

8. Device according to claim 3, characterized in that said further control means comprise a limiter device suitable for selecting the central part of said rectified sinusoidal component at each half of said period of the network voltage and an inverter suitable for inverting the output signal from the limiter device and commanding said second current generator.

9. Device according to claim 3, characterized in that said further control means comprise a comparator capable of comparing said rectified sinusoidal component with a reference voltage and the output signal of which commands said second current generator.

10. Device according to claim 1, characterized in that said control means can be integrated in a chip with the pilot circuit of said control device.

11. A controller for regulating an output signal that a boost converter generates from a time-varying input signal, the boost converter having a power switch and the input signal having a crossover amplitude, the controller comprising:

an error circuit operable to periodically activate the power switch for an on period that is related to the output signal; and

a distortion-reducing circuit coupled to the error circuit and operable to lengthen the on period while the input signal is within a predetermined amplitude range.

12. The controller of claim 11 wherein the error circuit comprises:

a first comparator operable to generate an error voltage that is related to the output signal;

a capacitor;

a current source operable to charge the capacitor; and

a comparator operable to activate the power switch while a voltage across the capacitor is less than the error voltage.

13. The controller of claim 11 wherein:

the error circuit comprises:

a first comparator operable to generate an error voltage that is related to the output signal,

a capacitor,

a current source operable to charge the capacitor, and

a comparator operable to activate the power switch while a voltage across the capacitor is less than the error voltage;

the on period begins substantially when the current source begins charging the capacitor; and

the on period ends substantially when the voltage across the capacitor equals the error voltage.

14. The controller of claim 11 wherein:

the error circuit comprises:

a first comparator operable to generate an error voltage that is related to the output voltage,

a capacitor,

a first current source operable to charge the capacitor,

a comparator operable to activate the power switch while a voltage across the capacitor is less than the error voltage, and

the distortion-reducing circuit comprises a second current source operable to discharge the capacitor while the input signal is within the amplitude voltage range.

15. The controller of claim 11 wherein the predetermined amplitude range includes the crossover amplitude.

16. The controller of claim 11 wherein the predetermined amplitude range is centered about the crossover amplitude.

17. A power supply, comprising:

a boost converter having a power switch and operable to generate an output voltage from a time-varying input voltage signal; and

a controller coupled to the converter and including,

an error circuit operable to regulate the output voltage by periodically activating the power switch for an on period that is related to the output voltage, and

a distortion-reducing circuit coupled to the error circuit and operable to lengthen the on period while the input voltage signal is within a predetermined voltage range.

18. An electronic system, comprising:

a power supply that includes,

a boost converter having a power switch and operable to generate an output voltage from a time-varying input voltage signal, and

a controller coupled to the converter and including,

an error circuit operable to regulate the output voltage by periodically activating the power switch for an on period that is related to the output voltage, and

a distortion-reducing circuit coupled to the error circuit and operable to lengthen the on period while the input voltage is within a predetermined voltage range.

19. A method, comprising:

generating an output signal from a time-varying input signal;

regulating the output signal by periodically drawing current through an inductor for an on period that is related to the output signal; and

lengthening the on period while the input signal is within a predetermined amplitude range.

20. The method of claim 19 wherein lengthening the on period comprises lengthening the on period while the input signal is within a predetermined amplitude range that includes zero amplitude.

21. The method of claim 19 wherein lengthening the on period comprises periodically drawing the current through the inductor by closing a switch for the on period.

22. The method of claim 19 wherein:

the output signal comprises an output voltage signal;

the input signal comprises an input voltage signal; and

the predetermined amplitude range comprises a predetermined voltage range.